HOUSE FLY CONTROL

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By F. C. Bishopp, *assistant chief in charge of research, and L. S. Henderson, entomologist, Division of Insects Affecting Man and Animals, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration*

House flies carry disease and filth. All sorts of germs can be found on their hairy legs and feet, and in their digestive tracts. They spread dysentery and typhoid, as well as intestinal worms. They are also very annoying to people and livestock.

We can control these pests by preventing them from breeding. Those that develop in spite of our efforts to prevent them, we must destroy or exclude from our homes.

How Flies Live

It is easier to control house flies if we know how they live. House flies lay their eggs in manure and fermenting vegetable matter. They feed upon and breed freely in the moist excrement of horses, hogs, chickens, and man. Garbage, fermenting farm wastes, and cattle manure, especially if mixed with straw, are also favorable breeding places. From 2 to 21 egg masses, each containing about 130 eggs, may be deposited by one female during a lifetime of 2 to 12 weeks.

The white eggs, which are laid in cracks in the manure, hatch in 10 to 24 hours. The larvae, or maggots, complete their growth in 3 to 7 days. They are then creamy white and about one-half inch long. They crawl to the edges of the manure pile; some may burrow into the soil near the breeding material, and the rest seek other suitable places in which to change to adult flies. While this change is taking place, the insects are in the pupal, or resting, stage. The barrel-shaped pupae are yellowish at first and dark brown later. In warm weather the pupal stage lasts from 3 to 6 days, but in cold weather it may last many weeks. When this change is completed, the adult flies push open the end of the pupal case, work their way to the surface, spread their wings, and are soon ready to fly away. They mate and the females are ready to lay eggs in 2½ to 20 days after emergence.

Prevent Flies From Breeding

The first step in the control of house flies is to keep them from breeding. There are several ways to do this. Choose the methods that best fit your local conditions and needs.

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Scatter Manure on Fields

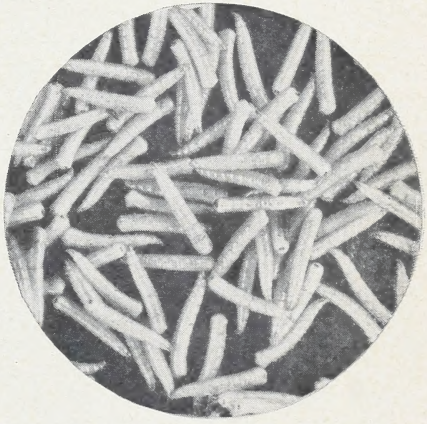
Remove manure and other farm waste every day and scatter it on fields wherever practical. A manure spreader is useful. Spread the material rather thin, so that any fly eggs or young maggots present will be killed by heat, cold, or drying.

Store Manure in Pits or Ricks

Where it is impractical to scatter manure every day, store it in fly-tight boxes or pits. They should be made preferably of concrete. Put the manure into the container promptly, and keep the doors closed when not in use. Place fly traps over holes in the top of the pit.

For storing large quantities of manure, pile the loads in rectangular stacks, or ricks. Make these ricks wide enough for the wagon or truck to drive over the top to dump and pack down the manure as each load is brought in. They may be as long as is necessary to hold all

House fly adult (enlarged).



House fly larvae (greatly enlarged).

the manure. Make the sides as nearly vertical as possible and pack them with a shovel. If possible, make a concrete base for the rick; dig a ditch around it, and pour crude oil in the ditch. The heat generated in the manure will kill many maggots and drive the rest to the surface. Many will drop into the ditch and be killed.

Treat Manure With Chemicals

Another way to prevent flies from breeding in manure is to treat it with chemicals to kill the eggs and maggots. Borax is effective for this purpose. Dissolve 11 ounces in about 5 gallons of water for each 8 bushels of manure. Sprinkle the solution on the manure after it has been piled. Manure treated at this rate can later be used for fertilizer if less than 15 tons per acre is applied. Heavier applications may injure some crops.

A mixture of two common fertilizers, calcium cyanamide and superphosphate, in equal parts will also greatly reduce fly breeding in manure. Scatter this mixture dry over the manure at the rate of 1 pound to each bushel, and then sprinkle thoroughly with water.

If manure is accumulating rapidly and is piled compactly, you will need to treat only the surface of the pile, as flies breed only in that part.

Construct and Care for Stables Properly

To aid in controlling flies on the farm, construct stable floors of concrete if possible. Pack dirt floors down hard, and occasionally remove the loosened manure-soaked surface dirt. Make plank floors as tight as possible, and scatter a little borax along the cracks every 2 weeks. Clean floors of all types often. Keep the corners of feed boxes and mangers clean, as flies often breed in such places.

Dispose of Sewage and Garbage

The danger of typhoid fever and other intestinal diseases can be avoided by the proper disposal of human excreta. In large towns and cities an adequate sanitary sewage system is generally provided, and all the houses should be connected with it. In smaller towns and rural communities sanitary privies,[1] from which flies are excluded, are a necessity. Until open-box privies can be replaced, prevent fly breeding in them by scattering over the excreta every 3 or 4 days enough borax to make a white covering.

Kill Flies With Sprays

Despite every effort to prevent their breeding, some flies will develop, especially on farms. To kill these flies, apply sprays in places where they gather and rest—in barns or around houses and where they get into houses or public buildings. Two types of fly sprays are used. Space sprays give quick knock-down of flies and are useful for obtaining immediate results. Residual sprays kill more slowly but leave a deposit that will be effective for a long time.

Because insecticides are sold in various forms and with different proportions of the active ingredient, it is important to read labels carefully and mix or apply according to directions.

Precautions

Do not spray oil solutions near fires.
Avoid unnecessary or prolonged exposure of the skin to insecticides.
Avoid breathing large amounts of the mist over an extended period.
Do not contaminate foods, dishes, or utensils with insecticides.

Space Sprays and Aerosols

Flies on the wing can be killed with space sprays—insecticides atomized into the air to form a floating mist of particles. Space sprays are most effective indoors. Fill the air with the mist and keep the room closed for half an hour. Use a good hand or electric sprayer.

For several years most fly sprays have consisted of pyrethrum extract dissolved in deodorized kerosene. These sprays are satisfactory

[1] Methods of constructing such privies and modern sewage-disposal systems are described in Farmers' Bulletin 1950, Sewage and Garbage Disposal on the Farm.

for general household use, because they give quick knock-down, are practically nonpoisonous to man and pets, and are not likely to damage furniture, draperies, or clothing. Pyrethrum sprays now contain piperonyl butoxide, *n*-Propyl Isome, sesame oil, or some other chemical that increases their effectiveness.

Several organic thiocyanates, which are synthetic chemicals, can also be used in space sprays. Sometimes these materials are combined with pyrethrum. DDT or methoxychlor is now included in some pyrethrum or thiocyanate space sprays.

Some fly sprays are graded according to their effectiveness against house flies. The grades are B, A, and AA, the last being the strongest. Ungraded sprays may be of excellent quality, but when the consumer buys graded sprays he can be sure of their quality.

Space sprays with particles of insecticide so fine that they remain floating in the air for several minutes are called aerosols. They may be produced by the use of a liquefied gas under pressure, as in the aerosol bombs, or with mechanical or thermal atomizers. The common killing agents in aerosols are pyrethrum and DDT or methoxychlor.

Residual Sprays

The greatest benefit from some of the new insecticides is obtained when they are applied as residual sprays to surfaces where flies crawl or rest. When properly applied in the right amount, some of them remain effective for several weeks or months. The flies are killed simply by their feet coming in contact with the sprayed surface for a short time. Residual sprays are important in the control of flies in and around buildings.

During the first several years that DDT was used, one application of a residual spray killed all flies that came in contact with the treated surface at any time during an entire season. Recently flies in many areas have developed a marked resistance to DDT. These flies may also be more difficult to control with some of the insecticides now used as substitutes for DDT.

Apply residual sprays with hand or power sprayers operating at low pressures (less than 100 pounds per square inch). High pressures cause waste, as the spray is broken up too fine and rebounds to create a mist. The object is to moisten the surface without causing run-off. You can best do this by using a nozzle that will give a flat or fan-type spray. Hold the nozzle about 18 inches from the surface and move it up and down the wall so as to moisten the surface evenly. One to two gallons will cover about 1,000 square feet.

Around Homes

Outside the house.—Apply residual sprays to screens, porches, garbage cans, and other places outside the house where flies gather. For this purpose use DDT, methoxychlor, lindane, or chlordane.

You can generally obtain DDT and methoxychlor as wettable powders or as emulsion concentrates at different concentrations. Both materials are recommended for use around homes at 2.5 percent strength for suspension sprays and 5 percent for emulsion sprays. To prepare a 2.5-percent suspension add 2 pounds of a 50-percent wettable powder to 5 gallons of water. One gallon of a 25-percent emulsion concentrate to 4 gallons of water will make a 5-percent emulsion.

Chlordane is available as a 2-percent solution in oil, which should be used as purchased. Emulsion concentrates containing 50 percent of this chemical are also on the market. Make a 2-percent spray by mixing 1 pint of this concentrate with 3 gallons of water.

Lindane is being sold as a 25-percent wettable powder and as an emulsion concentrate containing 20 to 25 percent of the insecticide. The finished spray should contain 0.3 to 0.5 percent of lindane. The approximate dilutions are given in the accompanying table.

Dilutions for lindane sprays

Lindane formulation	For 0.3-percent lindane spray		For 0.5-percent lindane spray	
	Formulation	Gallons of water	Formulation	Gallons of water
2.5-percent wettable powder	10 pounds	100	16 pounds	100
	½ pound	5	½ pound	3⅛
20-percent emulsion concentrate	1 gallon	65½	1 gallon	39
	1 pint	8¼	1 pint	4⅞
25-percent emulsion concentrate	1 gallon	82⅓	1 gallon	49
	1 pint	10⅓	1 pint	6⅛

Inside the house.—If a house is well screened and residual insecticides are used outside where flies concentrate, residual treatments inside the house are usually not necessary. The flies that do enter may best be killed with space sprays or aerosols.

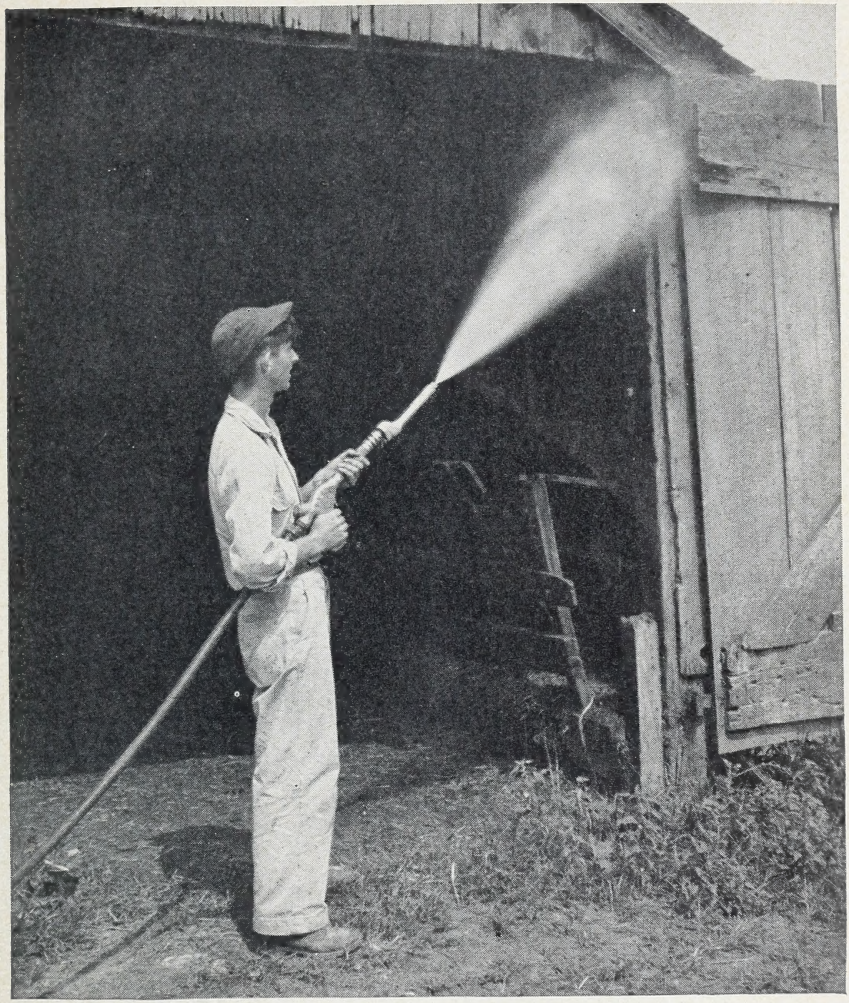
DDT and methoxychlor are the only residual insecticides now recommended for fly control within the house. A 5-percent solution of either material in refined kerosene is most suitable. You can apply it with an ordinary household sprayer or paint brush. Use enough to moisten the surface thoroughly, but not so much that the spray runs off. On most surfaces 1 quart of solution will cover about 250 square feet. Treat the flies' favorite resting places, such as screens, hanging light fixtures and drop cords, edges of arches, beams, door and window frames, and other projections or uneven places on the ceiling and walls. It is not usually necessary to treat the entire walls and ceiling.

In Dairy Barns and Milk Rooms

Residual sprays applied in dairy barns and milk rooms protect the livestock from annoyance by flies, help protect dairy products from insects and the germs they carry, and indirectly reduce the number of flies in the house and in other buildings.

Lindane and methoxychlor sprays are recommended for use inside dairy barns and milk rooms. You should apply them at the strengths recommended for treating around the home. DDT and chlordane are not recommended for such use. For treating barns, power sprayers are most satisfactory; compressed air or knapsack sprayers may be used.

Milk rooms should be well screened. If flies elsewhere on the farm are satisfactorily controlled, the space sprays may be the only treatments necessary to kill the flies that occasionally enter milk rooms.



Spraying a barn door with a power sprayer.

In Other Farm Buildings

Because flies also congregate in other farm buildings, such as beef-cattle and calf barns, stables, poultry houses, and hog pens, it is important that you treat these buildings. Spray them with DDT, methoxychlor, chlordane, or lindane in the manner described for their use around the home.

Large numbers of house flies can be caught in properly built traps set in the right places.

Catch Flies in Traps [2]

A trap 18 inches in diameter and 24 inches high, with the sides and top of screen and a screen cone inside reaching from the bottom nearly to the top, is most effective. The legs should be about 1 inch long. The frame may be made of barrel hoops and laths or of metal.

Place the bait beneath the trap in a shallow pan about 4 inches smaller in diameter than the base of the cone and 1 inch deep. Use any substance attractive to the house fly as bait. Blackstrap molasses diluted with three times as much water makes good bait. Milk and fruit waste are also suitable.

Set traps where flies naturally gather—usually on the sunny side of a building and out of the wind. Keep the bait pan well filled and wash it out occasionally. When the flies become piled more than a fourth of the way up around the cone, empty the trap. If you turn the trap upside down before opening it, you can shake the dead flies out without letting many of the live ones get away.

The number of traps required depends on the size of the premises and the abundance of flies. On a city lot 1 trap is usually sufficient; on a farm from 3 to 10 traps may be needed.

Destroy Flies by Various Means

Electrocuting devices that destroy flies have been developed. Although such devices cost much more than conical traps, they require less attention.

Flypapers, fly poisons, and swatters are useful for destroying occasional flies in homes or food-handling establishments. The safest and most effective poison consists of commercial formalin, 3 tablespoonfuls to 1 pint of milk or water, and a little brown sugar. Put some of this poison solution in a small glass jar, place a saucer holding blotting paper upside down on top of the jar, invert, and insert a piece of matchstick under the edge of the glass.

Exclude Flies With Screens

After you have prevented fly breeding by every method known and killed or destroyed as many flies as possible, there will still be flies. Foods in public places, as well as in homes, should be protected. Screens are indispensable in places where foods are kept and are essential for protection from flies in homes and many other places. Fit screens well and make screen doors open outward. In humid climates screens of copper, bronze, plastic, or one of the rust-resisting alloys are recommended; in dry regions galvanized or painted ones are satisfactory. Screens with 14 meshes to the inch will keep out house flies, but 16-mesh screens will exclude other insects also.

[2] More details on the construction and operation of traps are given in Farmers' Bulletin 734, Flytraps and Their Operation.

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